

What is claimed is:

1. A communication system for increasing a capacity by implementing one-frequency reuse with a non-spread spectrum system, wherein:

5 a transmitting station side transmits a transmitting signal obtained by a process of segmenting transmission information into a plurality of frames, of encoding each frame, of power amplifying each encoded signal with a different amplitude, and of interleaving all signals with
10 each amplified signal collected into one; and

a receiving station side reproduces said transmitting signal into original segmental frames by a process of de-interleaving said transmitting signal, of sequentially decoding codes of the signal in descending
15 order of Signal-to-Interference and Noise power Ratio, and of re-encoding the decoded signal to successively cancel the re-encoded signal from said transmitting signal.

20 2. The communication system according to claim 1, wherein a different interleaving pattern is used for each user.

3. The communication system according to claim 1,
25 wherein a different interleaving pattern is used for each cell.

4. The communication system according to claim 1,
wherein the transmitting station side is configured so
30 that a rate of amplitude amplification for each frame is changed according to a decoding capability in the

receiving station side.

5. The communication system according to claim 1,
wherein the transmitting station side is configured so
5 that the number of codes to be multiplexed is determined
according to a decoding capability or a process
capability realizable in the receiving station side.

6. The communication system according to claim 1,
10 wherein the transmitting station side is configured so
that propagation path conditions such as traffic
conditions are monitored at certain intervals to update
an amplitude value of each code with reference to the
number of considerable interference signals, the number
15 of code words for one frame and noise power according to
said propagation path conditions.

7. The communication system according to claim 6,
wherein the transmitting station side is configured so
20 that calculation of the amplitude value of each code is
performed by taking advantage of a residual interference
power composed of a power sum of undesired waves having
been not considered to be the considerable undesired
waves.

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8. The communication system according to claim 7,
wherein the transmitting station side is configured so
that the amplitude of a low-level code is increased when
an average residual interference power is of high level.

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9. The communication system according to claim 8,

wherein the transmitting station side is configured so that adjustment of the number of considerable interference signals, the number of codes for one frame and an amplitude margin is adapted to maintain an average transmission power when an increase of the amplitude of the low-level code is attained.

10. A transmitting apparatus for transmitting information using a non-spread spectrum system, comprising:

- frame segmenting means of segmenting transmission information into a plurality of frames;
- encoding means of encoding each frame;
- power amplification means of power amplifying each encoded signal with different amplitude;
- interleaving means of interleaving all signals with each amplified signal collected into one; and
- transmitting means of transmitting a transmitting signal obtained by the interleaving.

11. The transmitting apparatus according to claim 10, wherein said power amplification means is to change a rate of amplitude amplification for each frame according to a decoding capability in a receiving station side.

12. The transmitting apparatus according to claim 10, wherein said frame segmenting means is to determine the number of codes to be multiplexed according to a decoding capability or a process capability realizable in a receiving station side.

13. The transmitting apparatus according to claim 10,
further comprising propagation path condition monitoring
means of monitoring propagation path conditions such as
traffic conditions at certain intervals, wherein said
5 power amplification means is to update an amplitude value
of each code with reference to the number of considerable
interference signals, the number of code words for one
frame and noise power according to said propagation path
conditions.
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14. The transmitting apparatus according to claim 13,
wherein said power amplification means performs
calculation of the amplitude value of each code by taking
advantage of a residual interference power composed of a
15 power sum of undesired waves having been not considered
to be the considerable undesired waves.
15. The transmitting apparatus according to claim 14,
wherein said power amplification means is to increase the
20 amplitude of a low-level code when an average residual
interference power is of high level.
16. The transmitting apparatus according to claim 15,
wherein said power amplification means is to adapt
25 adjustment of the number of considerable interference
signals, the number of codes for one frame and an
amplitude margin to maintain an average transmission
power when an increase in the amplitude of the low-level
code is attained.
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17. A transmitting method for transmitting information

using a non-spread spectrum system, comprising:

a frame segmenting step of segmenting transmission information into a plurality of frames;

an encoding step of encoding each frame;

5 a power amplification step of power amplifying each encoded signal with different amplitude;

an interleaving step of interleaving all signals with each amplified signal collected into one; and

a transmission step of transmitting a transmitting
10 signal obtained by the interleaving.

18. The transmitting method according to claim 17,
wherein said power amplification step is to change a rate
of amplitude amplification for each frame according to a
15 decoding capability in a receiving station side.

19. The transmitting method according to claim 17,
wherein said frame segmenting means is to determine the
number of codes to be multiplexed according to a decoding
20 capability or a process capability realizable in a
receiving station side.

20. The transmitting method according to claim 17,
further comprising a propagation path condition
25 monitoring step of monitoring propagation path conditions
such as traffic conditions at certain intervals, wherein
said power amplification step is to update an amplitude
value of each code with reference to the number of
considerable interference signals, the number of code
30 words for one frame and the noise power according to said
propagation path conditions.

21. The transmitting method according to claim 20,
wherein said power amplification step is to perform
calculation of the amplitude value of each code by taking
5 advantage of a residual interference power composed of a
power sum of undesired waves having been not considered
to be the considerable undesired waves.

22. The transmitting method according to claim 21,
10 wherein said power amplification step is to increase the
amplitude of a low-level code when an average residual
interference power is of high level.

23. The transmitting method according to claim 22,
15 wherein said power amplification step is to adapt
adjustment of the number of considerable interference
signals, the number of codes for one frame and an
amplitude margin to maintain an average transmission
power when an increase in the amplitude of the low-level
20 code is attained.

24. A receiving apparatus for receiving a transmitting
signal obtained by a process of encoding each frame
resulting from segmentation of transmission information,
25 of power amplifying each encoded signal with a different
amplitude, and of interleaving all signals with each
amplitude signal collected into one, comprising:

de-interleaving means of de-interleaving said
transmitting signal;
30 decoding means of successively decoding codes of the
signal in descending order of Signal-to-Interference and

Noise power Ratio; and

signal canceling means of re-encoding the decoded signal to successively cancel the re-encoded signal from said transmitting signal.

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25. A receiving method for receiving a transmitting signal obtained by a process of encoding each frame resulting from segmentation of transmission information, of power amplifying each encoded signal with a different
10 amplitude, and of interleaving all signals with each amplitude signal collected into one, comprising:

a de-interleaving step of de-interleaving said transmitting signal;

a decoding step of successively decoding codes of
15 the signal in order of Signal to Interference and Noise power Ratio; and

a signal canceling step of re-encoding the decoded signal to successively cancel of the re-encoded signal from said transmitting signal.

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26. An unbalance code mixing method for carrying out an unbalance code mixing of information transmitted using a non-spread spectrum system, comprising:

a frame segmenting step of segmenting transmission
25 information into a plurality of frames;

an encoding step of encoding each frame;

a power amplification step of power amplifying each encoded signal with a different amplitude; and

an interleaving step of interleaving all signals
30 with each amplified signal collected into one.

27. The unbalance code mixing method according to claim 26, wherein said power amplification step is to change a rate of amplitude amplification for each frame according to a decoding capability in a receiving station side.

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28. The unbalance code mixing method according to claim 26, wherein said frame segmenting step is to determine the number of codes to be multiplexed according to a decoding capability or a process capability realizable in a receiving station side.

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29. The unbalance code mixing method according to claim 26, wherein said power amplification step is to update an amplitude value of each code with reference to the number of considerable interference signals, the number of code words for one frame and noise power according to said propagation path conditions.

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30. The unbalance code mixing method according to claim 29, wherein said power amplification step is to perform calculation of the amplitude value of each code by taking advantage of a residual interference power composed of a power sum of undesired waves having been not considered to be the considerable undesired waves.

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31. The unbalance code mixing method according to claim 30, wherein said power amplification step is to increase the amplitude of a low-level code when an average residual interference power is of high level.

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32. The unbalance code mixing method according to claim

31, wherein said power amplification step is to adapt
adjustment of the number of considerable interference
signals, the number of code words for one frame and an
amplitude margin to maintain an average transmission
5 power, when an increase in the amplitude of the code of
the low-level is attained.

33. A decoding method for decoding a transmitting signal
obtained by a process of encoding each frame resulting
10 from segmentation of transmission information, of power
amplifying each encoded signal with a different amplitude,
and of interleaving all signals with each amplitude
signal collected into one, comprising:

a de-interleaving step of de-interleaving said
15 transmitting signal;

a decoding step of decoding successively codes of
the signal in descending order of Signal-to-Interference
and Noise power Ratio; and

a canceling step of re-encoding the decoded signal
20 to successively cancel the re-encoded signal from said
transmitting signal.